

From Earth Missions to Deep Space Exploration (05)  
Habitation for Exploration Missions (3)

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## DEEP SPACE HABITAT DEVELOPMENT ROADMAP

### Abstract

The Advanced Exploration Systems Habitation Systems (AES-HS) project, formerly Habitat Demonstration Unit (HDU) has successfully designed, built, and field tested a Deep Space Habitat (DSH) demonstration prototype. The HDU-DSH prototype is a functional integration testbed for various technology programs in NASA, academia, and industry. The AES-HS project has been given the responsibility to evolve the integrated systems in the current HDU-DSH prototype into second and third generation higher fidelity flight-track habitat demonstrations, including the use of NASA Johnson Space Center's 20ft vacuum chamber fitted with functional ECLSS and operational cabin pressure. The demonstration flight-track includes exploring how ISS-derived modules could be re-purposed into a DSH, with the eventual goal of using the International Space Station (ISS) as an analog testbed for Earth-Moon L-1 outpost and Mars transit vehicle. This paper describes the DSH developmental roadmap, from the current HDU-DSH through ISS-based analogs and free-flyer habitats.